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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/684,401	10/10/2000	Timothy R. Miller	195272US-8	4464

7590 04/21/2004

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EXAMINER	
BURD, KEVIN MICHAEL	

ART UNIT	PAPER NUMBER
2631	10

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/684,401	MILLER, TIMOTHY R.	
	Examiner	Art Unit	
	Kevin M Burd	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. This office action, in response to the amendment filed 1/30/2004, is a non-final office action.

Response to Arguments

2. The previous objections to the abstract, specification and claims are withdrawn in view of the amendments.

Applicant's arguments, see amendment, filed 1/30/2004, with respect to the rejections of claims 1-88 under 35 USC 102(e) and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of the combination of Grabb et al (US 6,437,832) and Suzuki (US 6,121,844). The rejections are stated below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 12-17, 19-25, 31-49, 55-61, 63-77 and 83-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grabb et al (US 6,437,832) in view of Kawamura (US 6,356,157).

Regarding claims 1, 20 and 36, Grabb discloses an ultra wide band (UWB) communication system (column 4, line 66 to column 5, line 17). Figure 1 shows a receiver 107 for receiving an incoming UWB signal. The receiver generates a receiver signal at the UWB receiver 107. The receiver signal is analyzed in element 108. The signal is compared to a wideband overlay sequence from the wideband overlay sequence generator 109. Element 108 outputs a signal to the phase adjuster 110 and adjusts the phase to maximize the largest peak of the cross-correlator (column 5, lines 2-17). Grabb does not disclose comparing the incoming signal to a predetermined threshold and shifting the phase when the threshold is exceeded. Grabb discloses the use of a phase adjuster but does not disclose the components of the phase adjuster. Kawamura discloses a phase lock loop shown in figure 1. A signal is input to phase comparators, as is feedback signal. The input signal is compared to a predetermined threshold (the feedback signal) and when the signals are not equal, a phase correction is input to the charge pump 130. This includes when the input signal is beyond a predetermined threshold. The phase of the input signal is shifted according to the difference determined in the phase comparator. The phase lock loop of Kawamura discloses phase adjusting the input signal as shown in figure 1. This is a typical phase lock loop. It would have been obvious for one of ordinary skill in the art at the time if the invention to incorporate the PLL of Kawamura into the system of Grabb. This would allow for a short locking time and stable operation (abstract, Kawamura).

Regarding claims 2 and 21, the analysis result is an output from cross correlator 108.

Regarding claims 3 and 22, the combination discloses the output of the cross correlation is input to the PLL. This signal inherently has a correlation value and is to be matched with a feedback signal. If a match occurs, then the feedback signal will have the same correlation value as the input signal.

Regarding claims 4 and 23, the combination discloses the output of the cross correlation is input to the PLL. This signal inherently has an SNR value and is to be matched with the feedback signal. If a match occurs, then the feedback signal will have the same SNR value as the input signal.

Regarding claims 5 and 24, the combination discloses the output of the cross correlation is input to the PLL. This signal inherently has a bit error rate value and is to be matched with a feedback signal. If a match occurs, then the feedback signal will have the same bit error rate value as the input signal.

Regarding claims 6 and 25, the combination discloses the output of the cross correlation is input to the PLL. This signal is to be matched with a feedback signal. If a match occurs, then phase lock has been achieved

Regarding claims 12 and 31, the incoming UWB is a bi-phase signal (column 4, lines 30-45, Grabb).

Regarding claims 13 and 32, the incoming signal comprises two levels (column 4, lines 30-45).

Regarding claims 14 and 33, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 15, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 16, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 17, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 19, the PLL is locked when the phase difference between the input signal and the feedback signal is zero.

Regarding claim 34, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 35, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claims 37, 65 and 88, Grabb discloses an ultra wide band (UWB) communication system (column 4, line 66 to column 5, line 17). Figure 1 shows a receiver 107 for receiving an incoming UWB signal. The receiver generates a receiver signal at the UWB receiver 107. The receiver signal is analyzed in element 108. The signal is compared to a wideband overlay sequence from the wideband overlay

sequence generator 109. Element 108 outputs a signal to the phase adjuster 110 and adjusts the phase to maximize the largest peak of the cross-correlator (column 5, lines 2-17). Grabb does not disclose comparing the incoming signal to a predetermined threshold and shifting the phase when the threshold is exceeded. Grabb discloses the use of a phase adjuster but does not disclose the components of the phase adjuster. Kawamura discloses a phase lock loop shown in figure 1. A signal is input to phase comparators, as is feedback signal. The input signal is compared to a predetermined threshold (the feedback signal) and when the signals are not equal, a phase correction is input to the charge pump 130. This includes when the input signal is beyond a predetermined threshold. The phase of the input signal is shifted according to the difference determined in the phase comparator. The phase lock loop of Kawamura discloses phase adjusting the input signal as shown in figure 1. This is a typical phase lock loop. It would have been obvious for one of ordinary skill in the art at the time if the invention to incorporate the PLL of Kawamura into the system of Grabb. This would allow for a short locking time and stable operation (abstract, Kawamura). The phase will be altered for a value of less than 360 degrees since 360 degrees equals zero degrees and no phase adjustment is necessary.

Regarding claims 38 and 66, the analysis result is an output from cross correlator 108.

Regarding claims 39-43, 67-71 and 85, any phase difference will be compensated for until phase lock occurs.

Regarding claims 44, 45, 61, 72, 73 and 86, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change. This is the same as matching phase angles.

Regarding claims 46 and 74, the combination discloses the output of the cross correlation is input to the PLL. This signal inherently has a correlation value and is to be matched with a feedback signal. If a match occurs, then the feedback signal will have the same correlation value as the input signal.

Regarding claims 47 and 75, the combination discloses the output of the cross correlation is input to the PLL. This signal inherently has a bit error rate value and is to be matched with a feedback signal. If a match occurs, then the feedback signal will have the same bit error rate value as the input signal.

Regarding claims 48, 64 and 76, the combination discloses the output of the cross correlation is input to the PLL. This signal inherently has an SNR value and is to be matched with the feedback signal. If a match occurs, then the feedback signal will have the same SNR value as the input signal.

Regarding claims 49 and 77, the combination discloses the output of the cross correlation is input to the PLL. This signal is to be matched with a feedback signal. If a match occurs, then phase lock has been achieved

Regarding claims 55 and 83, the incoming UWB is a bi-phase signal (column 4, lines 30-45).

Regarding claims 56 and 84, the incoming signal comprises two levels (column 4, lines 30-45).

Regarding claims 57 and 87, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 58, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 59, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 60, the combination discloses the process of phase locking will be updated continuously. If the PLL of figure 1, Kuwamura, is not locked, the feedback signal will change.

Regarding claim 63, the PLL is locked when the phase difference between the input signal and the feedback signal is zero.

4. Claims 7-11, 26-30, 50-54 and 78-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grabb et al (US 6,437,832) in view of Kawamura (US 6,356,157) further in view of Fontana et al (US 6,239,741).

Regarding claims 7, 26, 50 and 78, the combination of Grabb and Kawamura discloses the communication apparatus and method stated above in paragraph 3. The

combination does not disclose amplifying the received signal to produce an amplified received signal. Fontana discloses amplifying the received signal to produce an amplified received signal. By amplifying the received signal, the UWB pulses are amplified to levels suitable for use by the high sensitivity pulse detector circuitry downstream of the receiver (column 3, lines 15-18). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the amplifying components and the method of amplifying disclosed by Fontana in the receiver of the combination of Grabb and Kawamura for the reason stated above.

Regarding claims 8, 11, 27, 30, 51 54, 79 and 82, the correlation step will determine the maximum peak of the correlation signal with the amplified signal as an input.

Regarding claims 9, 10, 28, 29, 52, 53, 80 and 81, the noise and bit error rate will not change once the signal has been amplified.

5. Claims 18 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grabb et al (US 6,437,832) in view of Kawamura (US 6,356,157) further in view of Rizzo et al (US 5,841,808).

Regarding claims 18 and 62, the combination of Grabb and Kawamura discloses the communication apparatus and method stated above in paragraph 3. The combination does not disclose determining a lock parameter indicative of an average noise value. Rizzo discloses calculating an average noise value of the environment from a threshold detector and determining if the incoming signal is properly phased (column

5, lines (16-20). This is done in correlation circuitry to make sure the correlation is locked to the correct value (column 5, lines 5-10). It would have been obvious for one of ordinary skill in the art at the time of the invention to use the average noise detector to ensure the correlation is locked properly to the correct value. Otherwise, false locks can occur and incorrect data will be processed.

Contact Information

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.

Kevin M. Burd
PATENT EXAMINER
4/16/04